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| 09/612,298      | 07/07/2000  | Tatsuya Kunikiyo     | 193414US2           | 8554             |

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EXAMINER

CAO, PHAT X

ART UNIT PAPER NUMBER

2814

DATE MAILED: 01/03/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.  
**09/612,298**Applicant(s)  
**Kunikiyo**Examiner  
**Phat X. Cao**Art Unit  
**2814**

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136 (a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

1) ☒ Responsive to communication(s) filed on Oct 10, 2001

2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.

3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

### Disposition of Claims

4) ☒ Claim(s) 1-20 is/are pending in the application.

4a) Of the above, claim(s) 2-6 and 16-20 is/are withdrawn from consideration.

5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.

6) ☒ Claim(s) 1, 7-9, and 13-15 is/are rejected.

7) ☒ Claim(s) 10-12 is/are objected to.

8) ☐ Claims \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

9) ☐ The specification is objected to by the Examiner.

10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are objected to by the Examiner.

11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved.

12) ☐ The oath or declaration is objected to by the Examiner.

### Priority under 35 U.S.C. § 119

13) ☒ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).

a) ☒ All b) ☐ Some\* c) ☐ None of:

1. ☒ Certified copies of the priority documents have been received.

2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_

3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\*See the attached detailed Office action for a list of the certified copies not received.

14) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

### Attachment(s)

15) ☒ Notice of References Cited (PTO-892)

18) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_

16) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

19) ☐ Notice of Informal Patent Application (PTO-152)

17) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s). 3

20) ☐ Other: \_\_\_\_\_

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## **DETAILED ACTION**

### ***Election/Restriction***

1. Applicant's election with traverse of claims 1 and 7-15 in Paper No. 5 is acknowledged. The traversal is on the ground(s) that "there is no serious burden on the examiner". This is not found persuasive because of the reasons in MPEP § 802.01. Note that the 2 inventions appear to be independent as claimed and there is no evidence of record to show otherwise.

The requirement is still deemed proper and is therefore made FINAL.

### ***Specification***

2. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

### ***Drawings***

3. Figures 27-36 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g).

### ***Claim Rejections - 35 USC § 102***

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

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A person shall be entitled to a patent unless --

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 1 and 9 are rejected under 35 U.S.C. 102(b) as being anticipated by JP. 04-179126.

JP ('126), in abstract, discloses a semiconductor device comprising: a semiconductor substrate 2 having a main surface along which a semiconductor element is formed; interlayer insulating films formed on the main surface; conductive interconnections 12 and 20 provided in a plurality of layers separated by the interlayer insulating films; conductive dummy interconnections 12a, 16, and 20a provided in the same layers as the interconnections 12 and 20 in two or more layers included in the plurality of layers; and a conductive dummy plug 24, 26, or 28 selectively buried in the interlayer insulating films to connect the dummy interconnections between the two or more layers and connected together with the dummy interconnections 12a, 16 and 20a to a stable potential line which holds a fixed potential (see abstract).

***Claim Rejections - 35 USC § 103***

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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7. Claims 1, 7-9, and 13-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over JP. 10-199882 in view of Lee (US. 5,441,915).

With respect to claims 1 and 7-9, JP ('882), in Fig. 2 and abstract, discloses a semiconductor device comprising: a semiconductor substrate 1 having a main surface along which a semiconductor element is formed; interlayer insulating films formed on the main surface; conductive interconnections 3, 5, 7, and 9 provided in a plurality of layers separated by the interlayer insulating films; conductive dummy interconnections 3A, 5A, 7A, 9A, and 12 provided in the same layers as the interconnections in two or more layers included in the plurality of layers, wherein the dummy interconnections are provided to sandwich an interconnection part included in the interconnections in at least one of the two or more layers and wherein the dummy interconnections also comprise a dummy interconnection 12 which is provided in a layer located over the at least one layer to cover the interconnection part; and a conductive dummy plug 4b, 6b, 8b, and 10b selectively buried in the interlayer insulating films to connect the dummy interconnections all together.

JP ('882) does not disclose the dummy interconnections connected to a potential power supply line.

However, Lee, in column 5, lines 57-65, teaches the obviousness of having the dummy lines left floating or grounded depending on their locations. Accordingly, it would have been obvious to connect the dummy lines of JP ('882) to the ground line because according to Lee, the

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dummy lines would be grounded when the dummy lines are adjacent to signal lines (see column 5, lines 62-65) for the known purpose of preventing cross-talk.

With respect to claims 13-14, JP ('882) also discloses in Fig. 3 the forming of a passivation film 11 covering the uppermost layer and having a higher thermal conductivity than the interlayer insulating films, and the forming of a heat sink 12 which is in contact with the passivation film 11.

With respect to claim 15, in view of teachings of Fig. 2 of JP ('882), it would have been obvious to modify Fig. 3 of JP ('882) by forming another conductive dummy plug (see dummy plugs 10b in Fig. 2) buried in the passivation film to connect the heat sink 12 and part of the dummy interconnection for the purpose of performing heat dissipation more efficiently (see abstract).

8. Claims 1, 7-9, and 13-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over JP. 10-199882 in view of Ma (US. 5,729,047).

As discussed in details above, JP ('882) substantially reads on the invention as claimed, except it does not disclose the dummy interconnections connected to a potential power supply line.

However, Ma, in Fig. 3, teaches the obviousness of forming the dummy interconnections surrounding the signal interconnection line 90 and connecting to the potential power supply line Vss. Accordingly, it would have been obvious to connect the dummy interconnections of JP

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('882) to the power supply line Vss because according to Ma, such modification would provide a signal isolation and decoupling in an integrated circuit device (column 1, lines 55-60).

*Allowable Subject Matter*

9. Claims 10-12 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The prior art of record fails to disclose all the combination of the semiconductor device structure as claimed, including the dummy connection having repetitive protrusions and recesses along its elongated direction.

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Phat X. Cao whose telephone number is (703) 308-4917. The Examiner can normally be reached on Monday through Thursday. If attempts to reach the Examiner by telephone are unsuccessfully, the Examiner's supervisor, Olik Chaudhuri, can be reached on (703) 306-2794.


Any inquiry of a general nature or relating to the status of this application should be directed to the Group receptionist whose telephone number is (703) 308-0956. Group 2800 fax number is (703) 308-7722 or (703) 308-7724.

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PC  
December 28, 2001

  
**PHAT X. CAO**  
**PRIMARY EXAMINER**